

Claims

1. A thermal treatment apparatus for heat-treating a substrate with the substrate being supported by a substrate support, wherein the substrate support has a main body portion and a supporting portion which is provided on the main body portion and in contact with the substrate, and the supporting portion is formed from a silicon platelike-member having a thickness larger than the thickness of the substrate.

2. The thermal treatment apparatus according to claim 1, wherein the thickness of the supporting portion is 10 mm or less.

3. The thermal treatment apparatus according to claim 1, wherein the thickness of the supporting portion is 3 mm to 6 mm.

4. The thermal treatment apparatus according to claim 1, wherein the thickness of the supporting portion is 4 mm to 5 mm.

5. The thermal treatment apparatus according to claim 1, wherein a substrate-placing face of the supporting portion, on which the substrate is placed, is provided with an anti-adhesion layer for preventing adhesion between the substrate and the supporting portion.

6. A thermal treatment apparatus for heat-treating a substrate with the substrate being supported by a substrate support, wherein the substrate support has a main body portion

and a supporting portion which is provided on the main body portion and in contact with the substrate, the supporting portion is made of silicon, and a substrate-placing face of the supporting portion, on which the substrate is placed, is coated with a film comprising one or a plural number of materials of silicon carbide (SiC), silicon nitride (Si_3N_4), silicon oxide (SiO_2), glassy carbon, and microcrystalline diamond.

7. The thermal treatment apparatus according to claim 6, wherein the substrate-placing face of the supporting portion is coated with the silicon carbide (SiC) film, and the thickness of the silicon carbide film is 0.1 μm to 50 μm .

8. The thermal treatment apparatus according to claim 6, wherein the substrate-placing face of the supporting portion is coated with the silicon carbide (SiC) film, and the thickness of the silicon carbide film is 0.1 μm to 15 μm .

9. The thermal treatment apparatus according to claim 6, wherein the substrate-placing face of the supporting portion is coated with the silicon carbide (SiC) film, and the thickness of the silicon carbide film is 0.1 μm to 10 μm .

10. A thermal treatment apparatus for heat-treating a substrate with the substrate being supported by a substrate support, wherein the substrate support has a main body portion and a supporting portion which is provided on the main body portion and in contact with the substrate, the supporting

portion is made of silicon, and a plural number of different films are stacked on a substrate-placing face of the supporting portion, and the hardness of an uppermost film is the lowest in the plural number of films at heat treatment temperature, or the uppermost film is amorphous.

11. The thermal treatment apparatus according to claim 10, wherein the plural number of films comprise any of materials of silicon carbide (SiC), silicon nitride (Si_3N_4), polycrystalline silicon (Poly-Si), silicon oxide (SiO_2), glassy carbon, and microcrystalline diamond.

12. The thermal treatment apparatus according to claim 10, wherein the uppermost film is a silicon oxide (SiO_2) film.

13. A thermal treatment apparatus for heat-treating a substrate with the substrate being supported by a substrate support, wherein the substrate support has a main body portion and a supporting portion which is provided on the main body portion and in contact with the substrate, and the supporting portion is made of silicon, and a silicon carbide (SiC) film is formed on a substrate-placing face of the supporting portion, in addition, a silicon oxide (SiO_2) film is formed on an uppermost surface.

14. A thermal treatment apparatus for heat-treating a substrate with the substrate being supported by a substrate support, wherein the substrate support has a main body portion and a supporting portion which is provided on the main body

portion and in contact with the substrate, and the supporting portion is made of silicon, and a coating film is formed on a substrate-placing face of the supporting portion, and the hardness of the coating film is lower than the hardness of the substrate during heat treatment at heat treatment temperature, or the coating film is amorphous.

15. A method for manufacturing a substrate, comprising:
carrying a substrate into a treatment room;
supporting the substrate by a supporting portion formed from a silicon platelike-member having a thickness larger than thickness of the substrate;
heat-treating the substrate in the treatment room with the substrate being supported by the supporting portion; and
carrying out the substrate from the treatment room.

16. A method for manufacturing a substrate, comprising:
carrying a substrate into a treatment room;
supporting the substrate by a silicon supporting-portion wherein a substrate-placing face, on which the substrate is placed, is coated with a film comprising one or a plural number of materials of silicon carbide (SiC), silicon oxide (SiO₂), glassy carbon, and microcrystalline diamond;
heat-treating the substrate in the treatment room with the substrate being supported by the supporting portion; and
carrying out the substrate from the treatment room.

17. A method for manufacturing a semiconductor device,

comprising:

carrying a substrate into a treatment room;

supporting the substrate by a supporting portion formed from a silicon platelike-member having a thickness larger than the thickness of the substrate;

heat-treating the substrate in the treatment room with the substrate being supported by the supporting portion; and
carrying out the substrate from the treatment room.

18. A method for manufacturing a semiconductor device, comprising:

carrying a substrate into a treatment room;

supporting the substrate by a silicon supporting-portion wherein a substrate-placing face, on which the substrate is placed, is coated with a film comprising one or a plural number of materials of silicon carbide (SiC), silicon oxide (SiO₂), glassy carbon, and microcrystalline diamond;

heat-treating the substrate in the treatment room with the substrate being supported by the supporting portion; and
carrying out the substrate from the treatment room.